SIEMENS

VideoRec

RA

Service Instructions

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Revisions

Chapter	Page	Rev.
all	all	01
all	all	02
all	all	03

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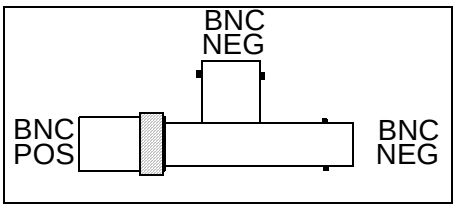
General Remarks/Function Information

- The VideoRec is composed of:
  S-VHS Recorder (SVO-9500MD(P) with built-in parallel interface.
  Scan Converter VSC 36 SHC 50/60.
  SSi22 VCR interface with cable set.
- With the VideoRec, N or H video signals can be recorded on N-SVHS video recorders (Sony).
- With H video signals, a downscan selection takes place automatically in the VSC 36 SHC scan converter.
- Playback takes place via the upscan of the VSC 36 SHC on the H control room monitor or on the control room and examination room monitors.
- The control of automatic exposure (cine/DCM fluoro can be jumpered) takes place over the SSI22 VCR interface of the X-ray system(M96, M96C, system distributor)
- The SSI22 VCR interface is powered over the X-ray system with 24V.
- Automatic monitor switch-over by the interface, and there is also an automatic switch-over to VCR playback in the interface when there is playback of the S-VHS recorder. If radiation is triggered, the monitors are switched over to the X-ray system as a default setting.
- NOTE: If cine is selected while the VCR is in the playback mode, the video recorder is switched immediately to record! This means that any scene being played back will be written over!
- Warning signal generator (in the SSI22 VCR interface),
  - when the tape reaches the end
  - when there is no video cassette inserted
  - when the VCR power is switched off
  - when the VCR is operated manually during cine, a warning signal is sounded.
- Warning output over X4, Pin 6:
  - can be switched on/off using a jumper, see paragraph entitled, Recording.
  - at the end of the tape
  - if no video cassette is inserted
  - if the VCR power is switched off
  - if the interface power is switched off
  - if a manual control is made at the VCR during automatic recording.
- The power line voltage for the VideoRec is 230V; except for 60 Hz the video recorder must be connected to 120V.
- For spare parts, see the Video Components Spare Parts List, RA53-050.081.01...
- Note: when setting up the video recorder, make sure there is good air circulation around it. The minimum space between the VCR and the sides of built-in consoles or other components must be at least 3 cm.
  If two video recorders are configured in a biplane system, to permit good heat dissipation, under no circumstances may they be closer than 3 cm to each other, i.e., they may not be placed next to each other in the optinally available control console. However it is possible to place one on top of the other.
  Pay attention to good air circulation.

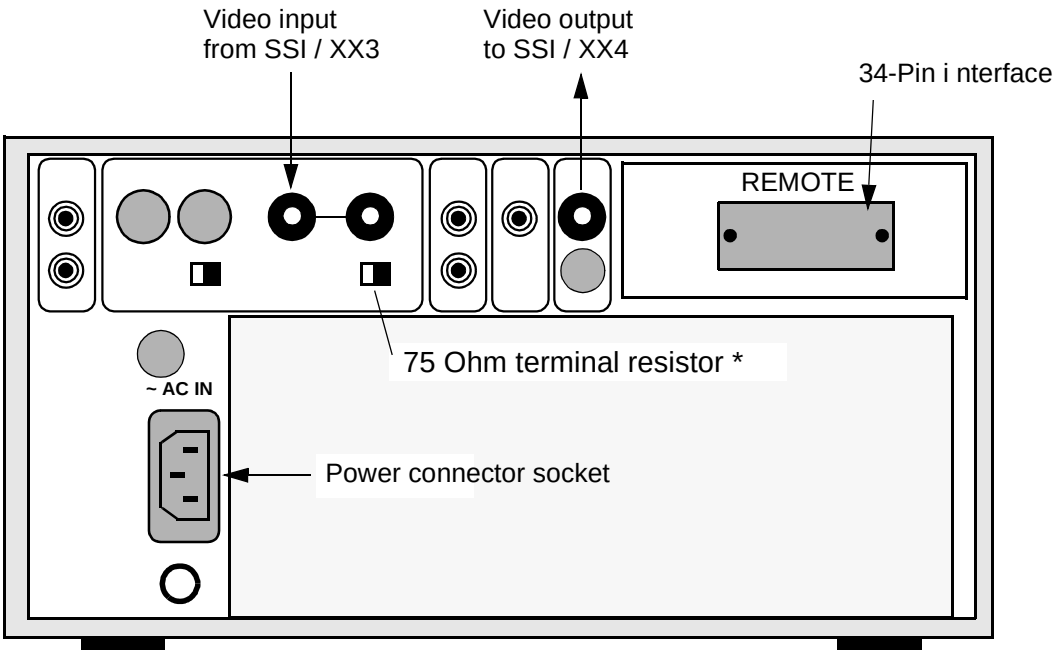
Required Aids/Tools

- Standard service tool kit, as defined in ARTD, Part 3
- Memory oscilloscope, as defined in ARTD, Part 3
- Mavo monitor, as defined in ARTD, Part 3
  Part No. 97 02 432 Y0526
- Digital voltmeter, as defined in ARTD, Part 3
- TV Dynamics Test
- BNC connector, Part No. 30 06 590



S-VHS Video Recorder (Sony)

- Recording of N video signals on S-VHS tapes.
- Playback of N-recorded S-VHS tapes.
- Can be remotely controlled over a built-in 34-pin interface.
  IMPORTANT: Only the S-VHR recorder (Sony) shipped with VideoRec has this interface!
- The 60Hz model can be operated only at 120V!

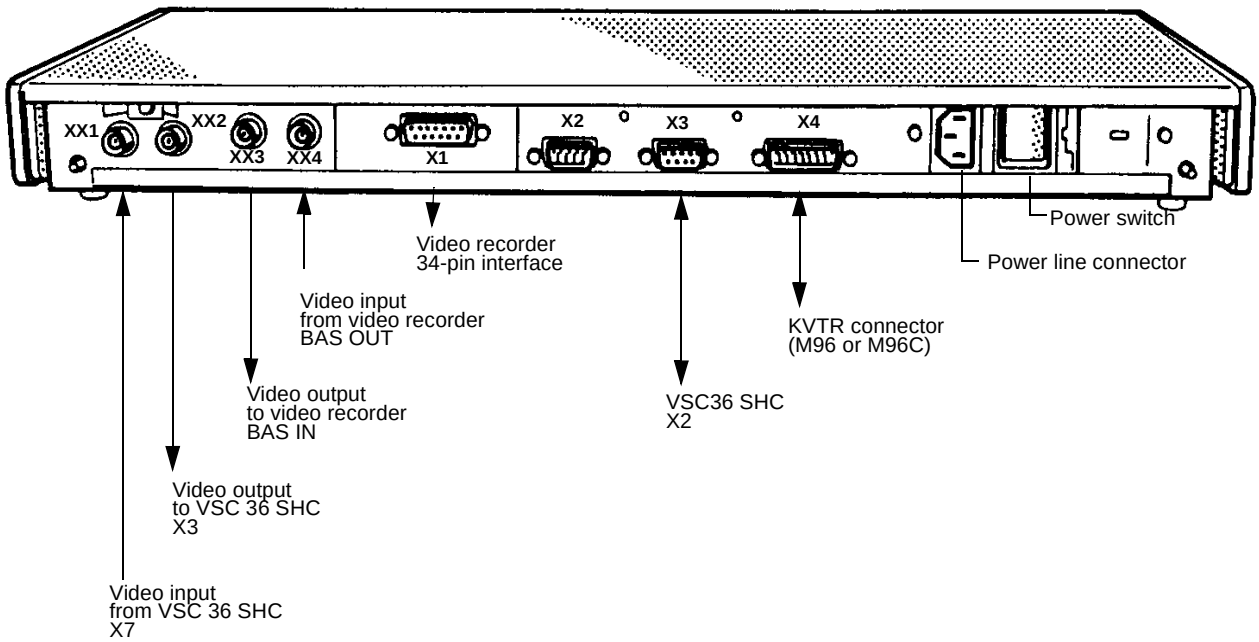


* Note: The terminal resistor for the loop-through output must be set to ON.

SSI 22 VCR Interface

- LED display of power On.
- 2x optical video separation (required, because the video recorder may be operated with a ground wire and ground loops must be avoided), for input and output of the video recorder.
- Automatic control of record function of the video recorder, depending on the X-ray system.
- Control of monitor switch-over and of upscan function in the VSC 36 SHC with video recorder playback.
- Starting with Serial No. 95391, a Cosinus Enhancer (edge enhancement) for VCR recording is integrated.
- Warning signal output to X4 Pin 6. Output “only“ with selection of record!
  Monitored functions:
  When no cassette is inserted.
  When the tape is at the end.
  When there is no power to the interface.
  If the recorder is manually operated during an automatic recording.
  Up to Serial No. 95334 the transistor switches to ground!
  Starting with Serial No. 95334 or when using the repair/replacement procedure, when there is a warning ground is sent out (via transistor) with OK +24V over 2.7kOhm .

- For jumpering of the different functions, see the section on Repair.

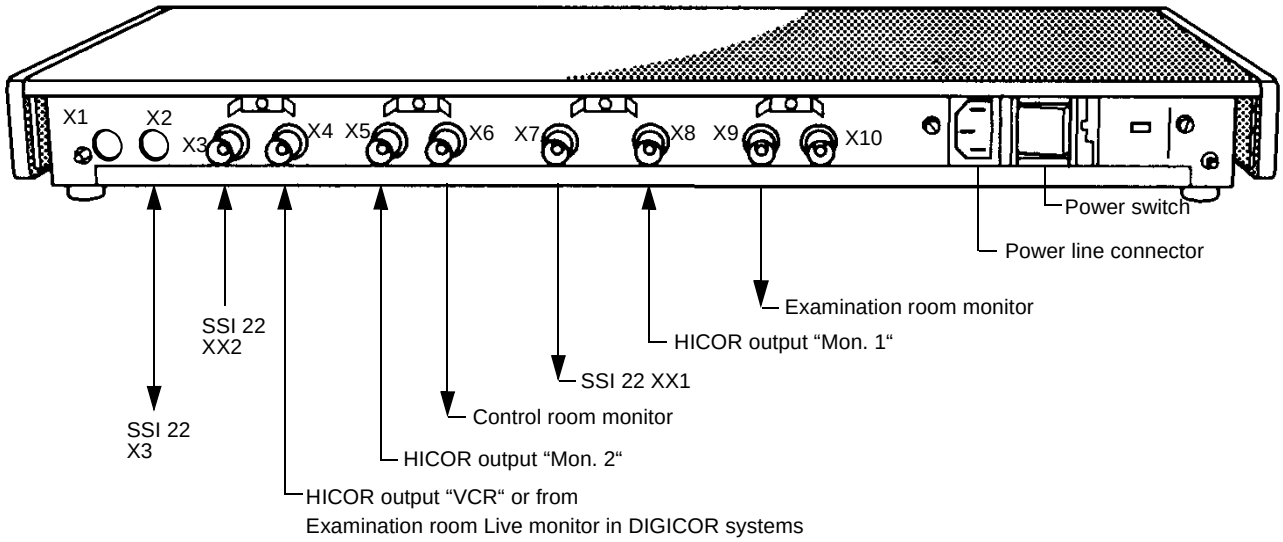


Note: The spade connectors on the quick connectors above coax sockets XX1 and XX2 are used to connect the external shielding of the triax cable. Connector X2 is not used.

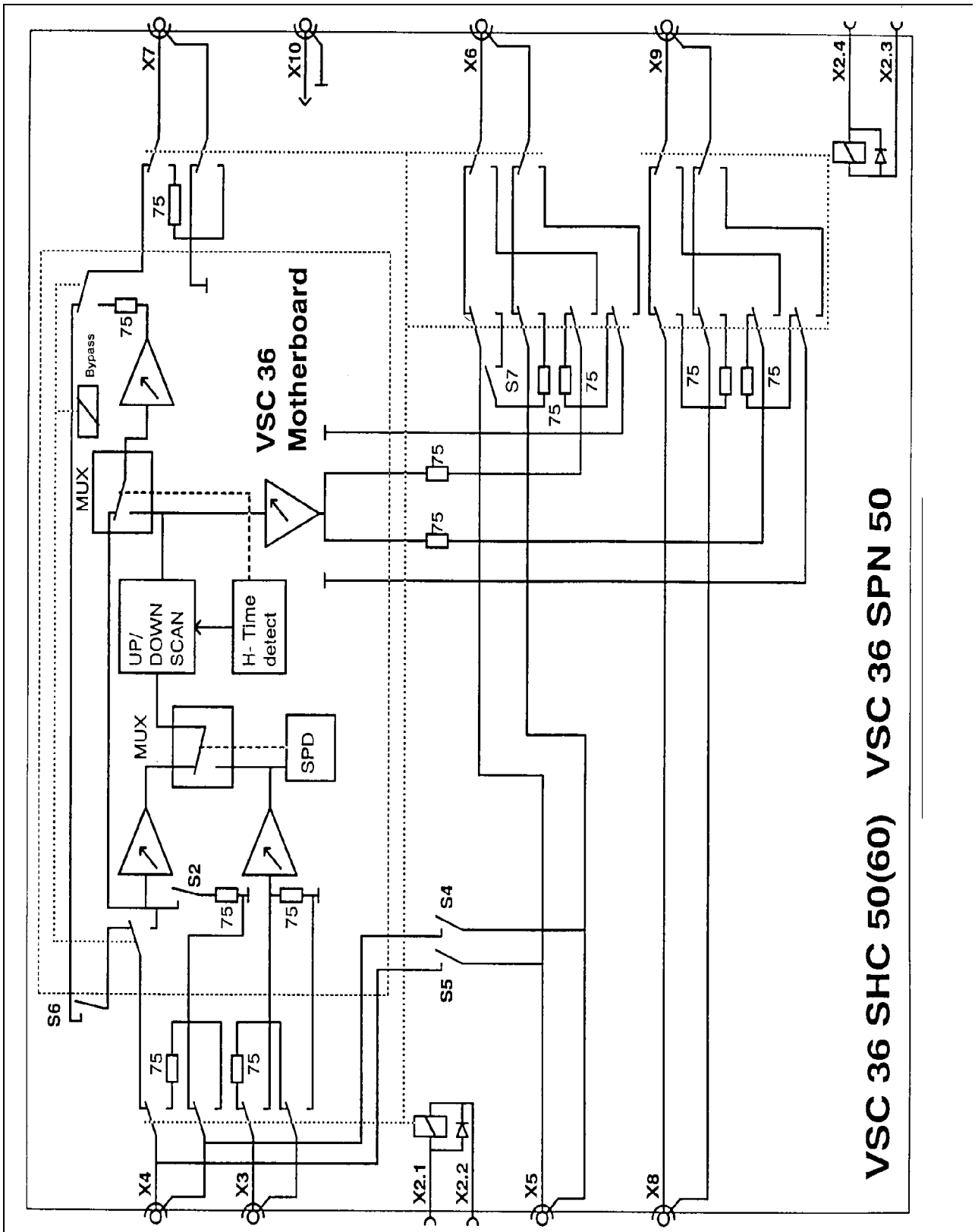
VSC 36 SHC Video Scan Converter, 50 or 60 Hz

- LED display of power ON.
- NOTE: two different scanners are needed for 50 and 60 Hz video scan rates.
- Automatic recognition of H-line video input signals and switch-over to downscan or bypass with N video signals.
- Adaptation of the different input signals to a 1V standard signal for the video recorder in the downscan mode.
- Depending on the control by the video recorder or X-ray system (via the SSI22 VCR interface):
  Upscan mode for VCR playback.
  Monitor switch-over to X-ray system or VCR playback.

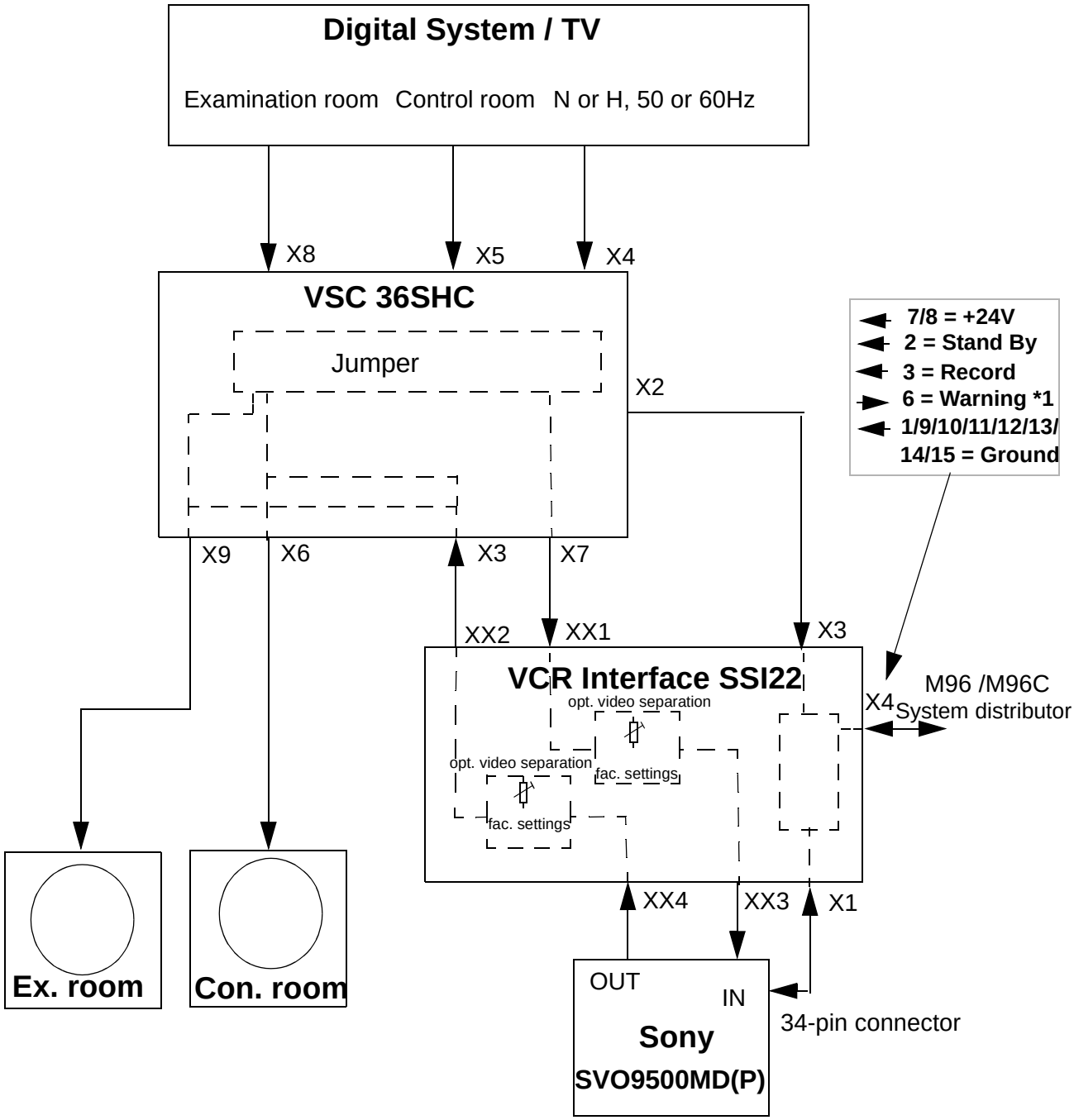
Adaptation of the $1V_{pp}$ video signals from the video recorder to HICOR monitors to $1.4V_{pp}$ for upscan.



Note: The spade connectors on the quick connectors above coax sockets XX1 and XX2 are used to connect the external shielding of the triax cable. Connectors X1 and X10 are not used.


VSC 36 SHC 50(60) VSC 36 SPN 50
VSC 36 Motherboard
X7
X10
X6
X9
X2.4
X2.3
X4
X3
X2.1
X2.2
X5
X8
S2
S4
S5
S6
S7
MUX
Bypass
UP/ DOWN SCAN
H- Time detect
SPD
75

Cabling Schematic



*1 Warning signal output, see paragraph
“Description of Assemblies“, SSI 22 VCR Interface .

S-VHS Recorder, Sony SVO 9500 MD(P)

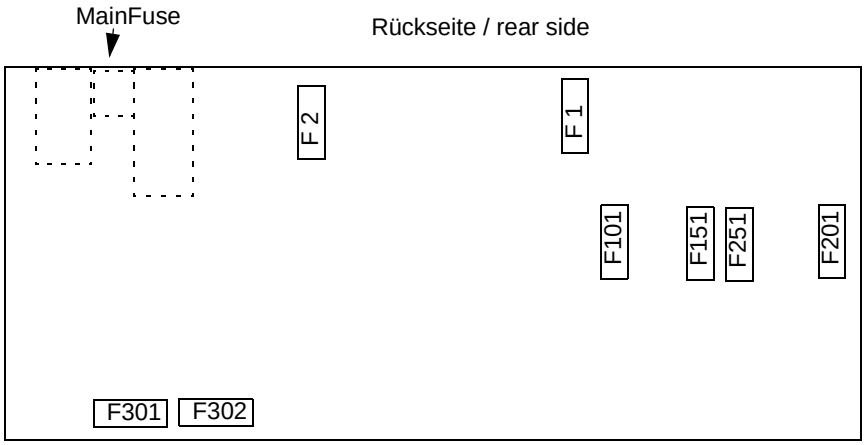
The recorder is thought of as a black box and must be replaced completely.

IMPORTANT: Every returned recorder must be accompnaied by a detailed description of the malfunction!

SSI22 VCR Interface

No function or only partial function - check the power fuses on the rear of the unit (at the power input) and check the internal fuses.

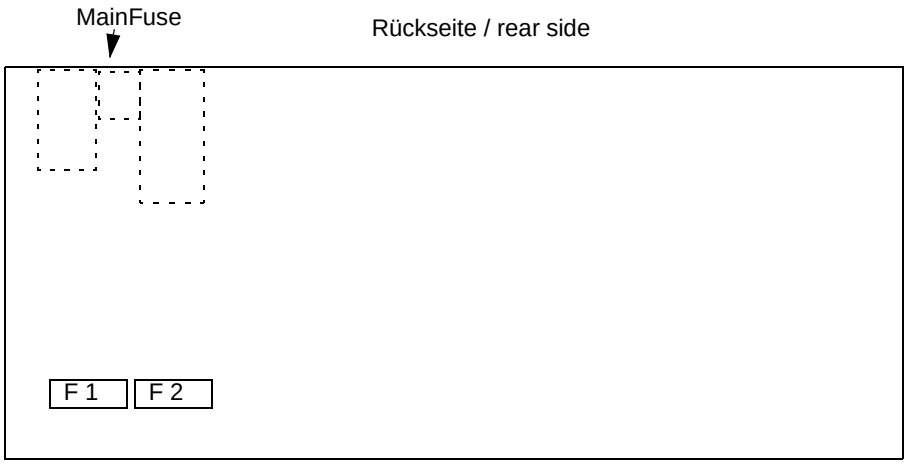
IMPORTANT: Every returned interface must be accompanied by a detailed description of the malfunction!



VSC 36 SHC Scan Converter

No function or only partial function - check the power fuses on the rear of the unit (at the power input) and check the internal fuses.

IMPORTANT: Every returned scanner must be accompanied by a detailed description of the malfunction!



Replacing the Sony Video Recorder

- ***NOTE:*** ***Only the model listed in the Spare Parts List (RA53-050.081.01...) (additional interface) may be used.***

  Only an SVO 9500 MDP (Pal, 230 V) may be used with 50 Hz power line systems.
  Only an SVO 9500 MD (NTSC, 120 V) may be used with 60 Hz power line systems.

- Connect the video input / output and interface cables “as before”.

- Set the 75 Ohm termination switch to ON (no loop-through mode), with connection of a video printer to OFF (termination is in printer).
- Y-Enhancer:
  The video recorder is equipped with a switchable Y-Enhancer (edge enhancement with playback). This enhancer is set to ON when shipped from the factory and must be switched off as follows:
  CTL / MENU - set switch in the **“MENU”** position.
  ITEM - continue to press key until **“4 EN**-....” appears in the display.
  DATA - press key until **“4 EN--OF”** is set.
  CTL / MENU - set switch back to the **“CTR”** position.

Replacing the SSI22 VCR Interface

Jumper Positions

Jumper	Norm	Function
X5	OFF	*1 OFF-Warning signal output when there is a recording error. ON - **No** warning signal output with recording error.
X6	OFF	ON-Playback on control rooml/examination room monitor. OFF-Playback on control room monitor
X7	ON	*2 ON- Cine/DCM/Acquisition recording only. OFF- Fluoro and Cine/DCM/Acquisition recording.
X8	OFF	Always set to OFF
X9	ON	On - Warning signal when there is a recording error. OFF - No warning signal with recording error

***1** Starting with Serial No. 95 334 a warning signal is output over socket X4, Pin 6 (used with MULTISTAR T.O.P configured with the cine option).
Spare parts have been upgraded.

***2** When used with the Multistar T.O.P. or CARD III, it is always set to “ON“. Setting for “only“ record or for fluoro and record see the Configuration Guide for Multistar T.O.P. or the POLYDOROS IS Service Instruction for CARD III.

Cosine Enhancer:
Up to Serial No. 95 391 “several“ enhancers were built in; with these enhancers the switch must be set to the “0 - position“ (off).
Starting with Serial No. 95 391, the Cosine Enhancer is fully functional; for adjustment,see the chapter “Adjustment“.

No further adjustments are necessary.

VCR - Interface SSI 22

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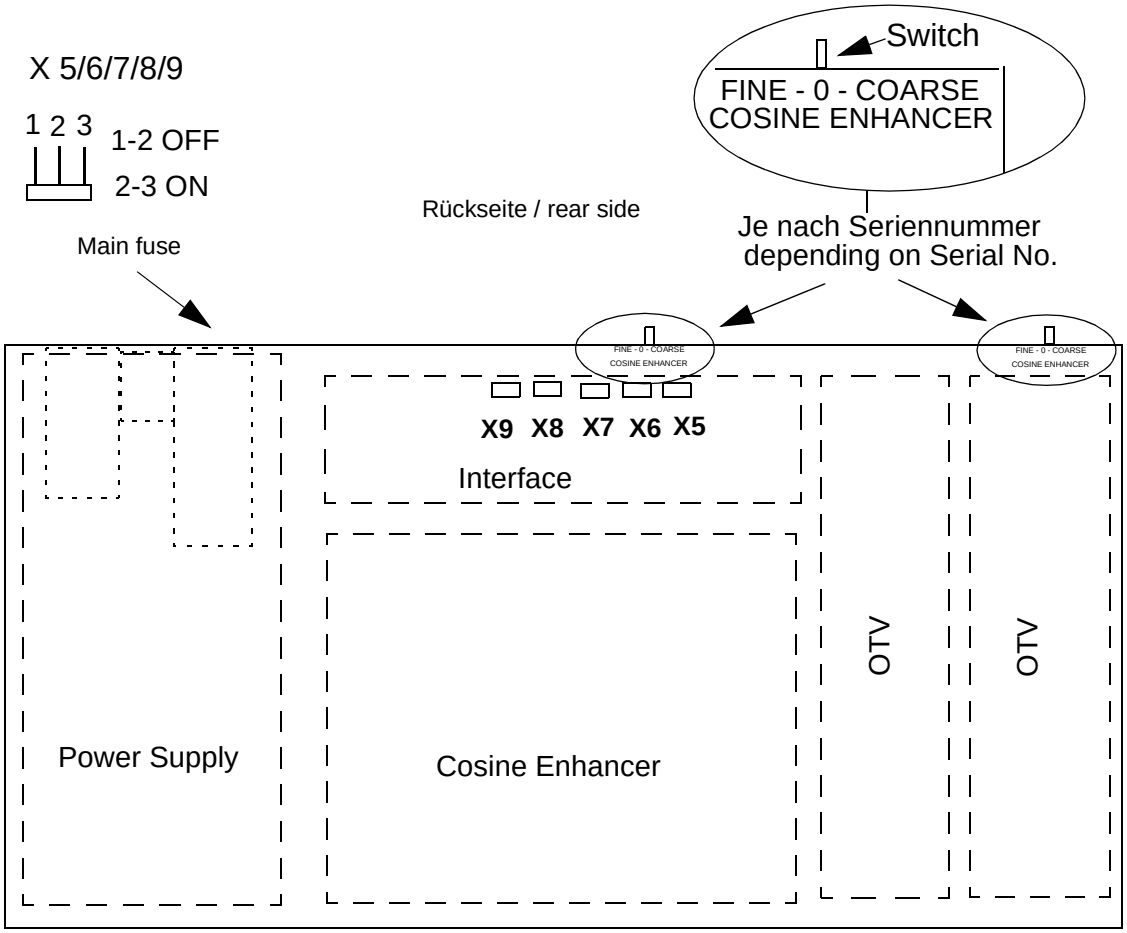


Replacing the Video Scan Converter

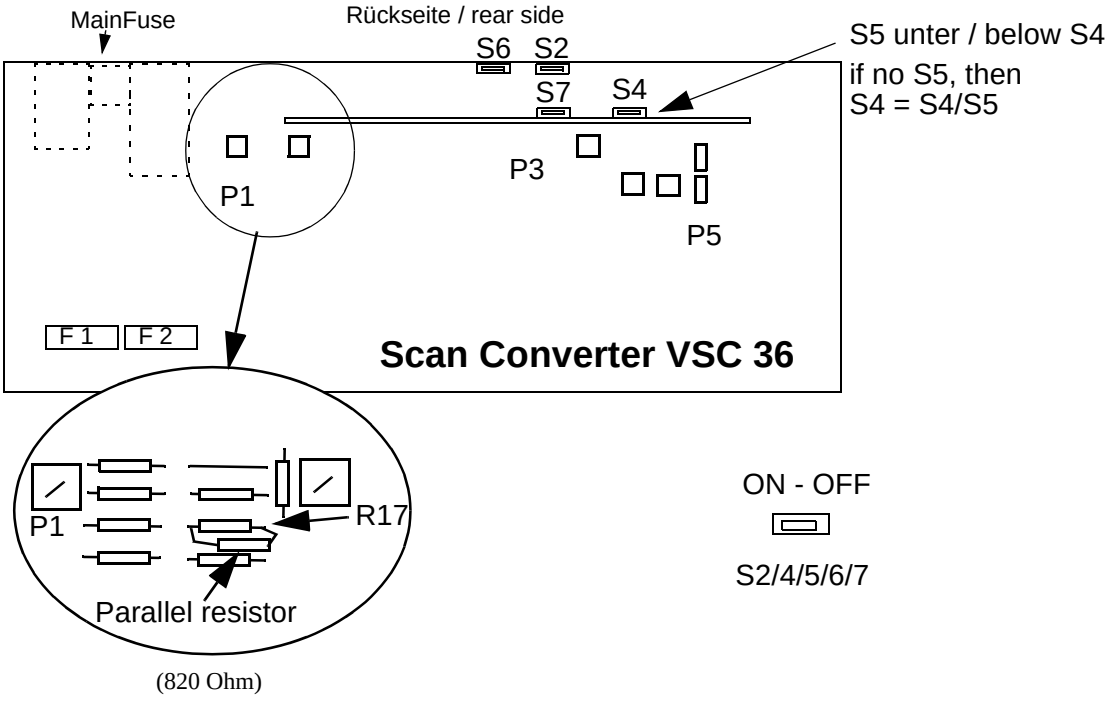
Connect all inputs/outputs as they were previously connected.

Switch Positions

	DIGICOR with control room monitor	DIGICOR without control room monitor	Polytron	Hicor/ Multistar T.O.P.	Function
S2	OFF	ON	OFF	ON	Switchable terminal resistor for X4 input
S4/5	ON	OFF	ON	OFF	Loop-through of X4 input to X6 output
S6	OFF	OFF	OFF	ON	ON = Bypass Scanner with Power Off. OFF =No Bypass with Power Off.
S7	OFF	OFF	OFF	ON	Terminal resistor for X5 input with UP scan.
*	Remove	Remove	Remove	Leave	Change of the potentiometer adjust-ment range for DOWN Scan

* Remove the parallel resistor to R17, see illustration.

J1 to J30 factory settings - specifications for conversion / size / position.



General Remarks

Adjustment is divided into three sections:

VCR record mode

VCR playback mode

Cosine enhancer adjustment.

For adjustment, see below.

Note:
The Simomed H monitor has its own set of adjustment parameters for each norm. This means that if necessary, every norm which is being used must be adjusted (image alignment and contrast)!

e.g. HICOR:

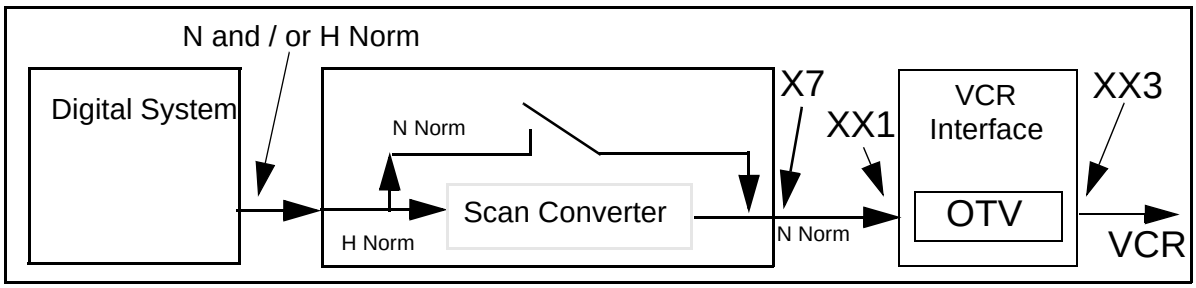
With the HICOR, the 1249 lines/100 Hz (1023 lines/120 Hz) norm is used for the monitor.
With the VideoRec, the 1249 lines/50 Hz (1023 lines/60 Hz) norm is used for the monitor.
With bypass, the 1249 lines/50 Hz (1023 line/60 Hz) norm is used for the monitor.

e.g. MULTISTAR T.O.P:

With a digital system, 2249 lines/60 Hz are used for the monitor,
With bypass, 1125 lines/60 Hz are used for the monitor (the same norm for the monitor as with 2249 lines/60 Hz !!),
With the VideoRec, 1249 lines/50 Hz (1023 lines/60 Hz) are used for the monitor.

Adjusting the Amplitude Parameters for VCR Record Mode

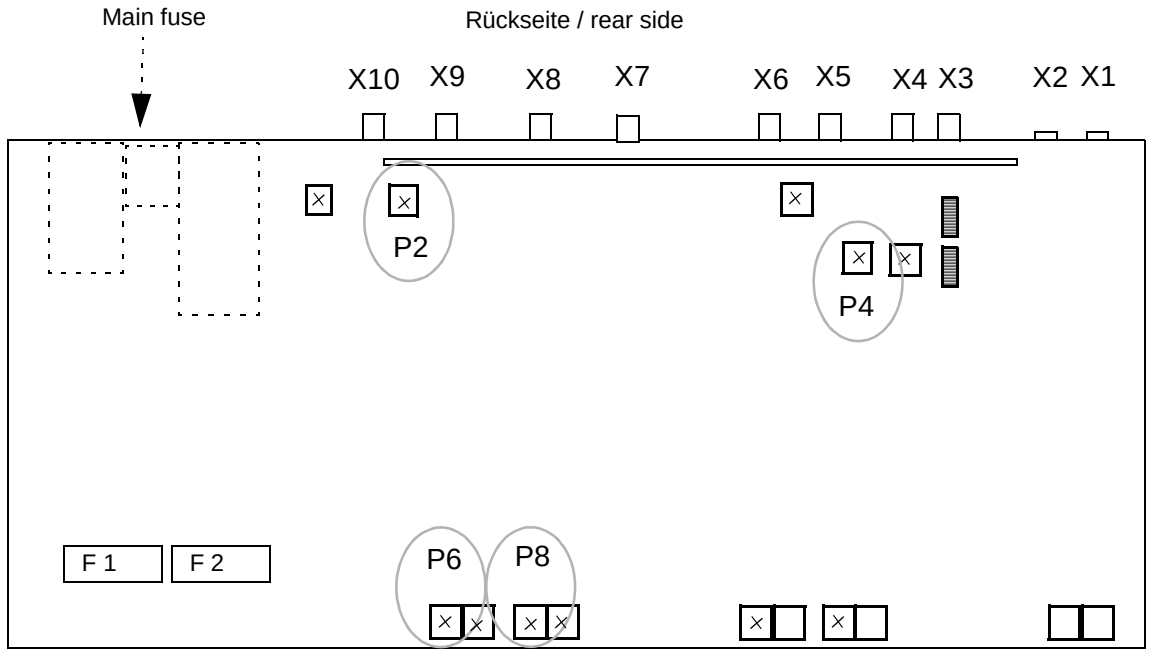
Illustration of the Principle Used for Record Mode



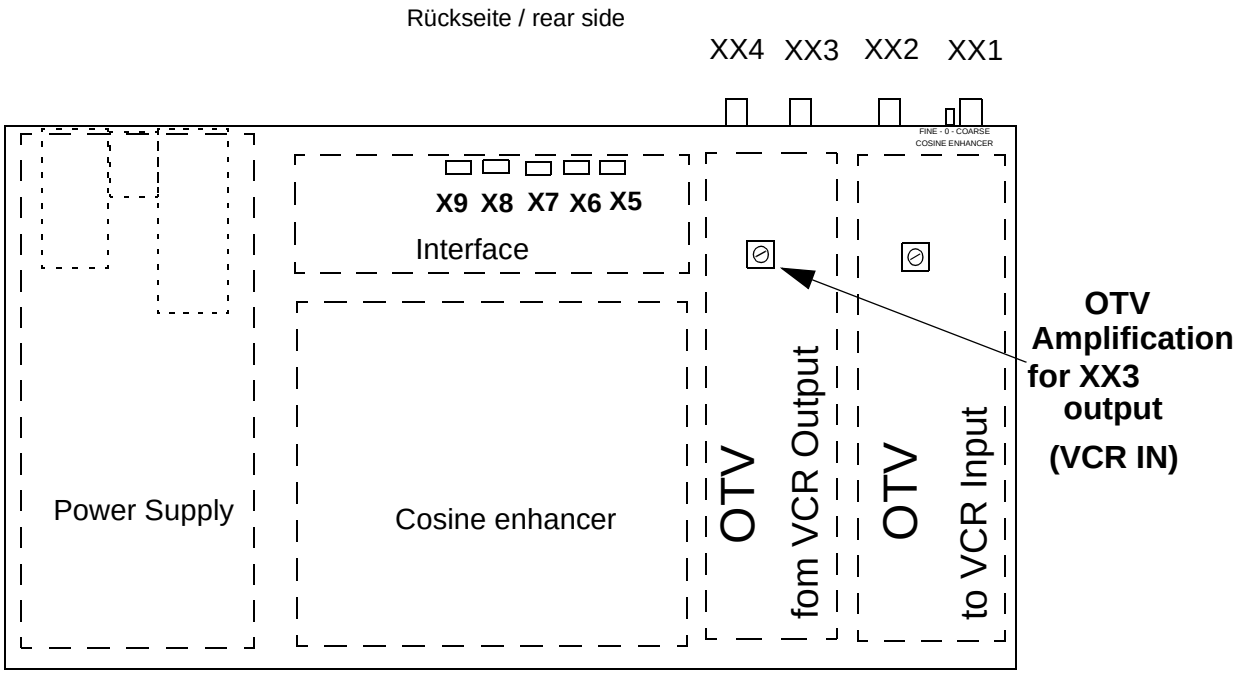
- If a cosine enhancer is configured (see the Chapter on Replacement), it must be switched off during the adjustment (in the 0 position).
- Feed in the SMPTE test pattern for the digital system.
  If a digital system is not configured, a recording of the TV dynamic test (record mode) can also be used (field 2L must have the max. amplitude).
- Adjusting the output amplitudes :
  Connect the oscilloscope Channel 1 to output X7 using BNC connectors (scan converter), set 200 mV, 5 ms, Trigger int. Channel 1
  - If there is “only“ an N input, there is no adjustment.
  - With an N input and in the H backup mode (e.g. HICOR) etc. :
    Measure the BA amplitude with the N Norm and with the H Norm
    Use P2 to adjust the S portion to 0.3V, +/-30mV.
    Use P4 to adjust the BA portion to the same value as for the N Norm, but max. 0.7V, +/- 30mV.
  - With “only“ the H Norm:
    Use P2 to adjust the S portion to 0.3V, +/-30mV.
    Use P4 to adjust the BA portion to 0.7V, +/-30mV.

  Connect the oscilloscope Channel 1 to output XX3 (VCR Interface) using BNC connectors, set 200 mV, 5 ms, Trigger int. Channel 1
  - Use potentiometer R151 for VCR IN (VCR Interface) to adjust to 1V, +/-30mV BAS.
- Adjustment of the downscan size / position parameters (horizontal only):
  If there is “only“ the N input, there is no adjustment.
  With a H input, carry out the adjustment as follows if needed.
  Correct adjustment of the upscan size/position parameters is prerequisite, see paragraph “Use..... : to adjust the amplitude and size/position parameters“ !!
  The setting can only be changed prior to VCR record and can only be evaluated with VCR playback; change the potentiometer setting only slightly !!
  Use P6 to adjust the horizontal position, centered on the monitor.
  Use P8 to adjust the horizontal size (with a circle, it must be round).
- If a cosine enhancer is configured, it must be switched back on.

VSC 36 Scan Converter



SSI22 VCR Interface

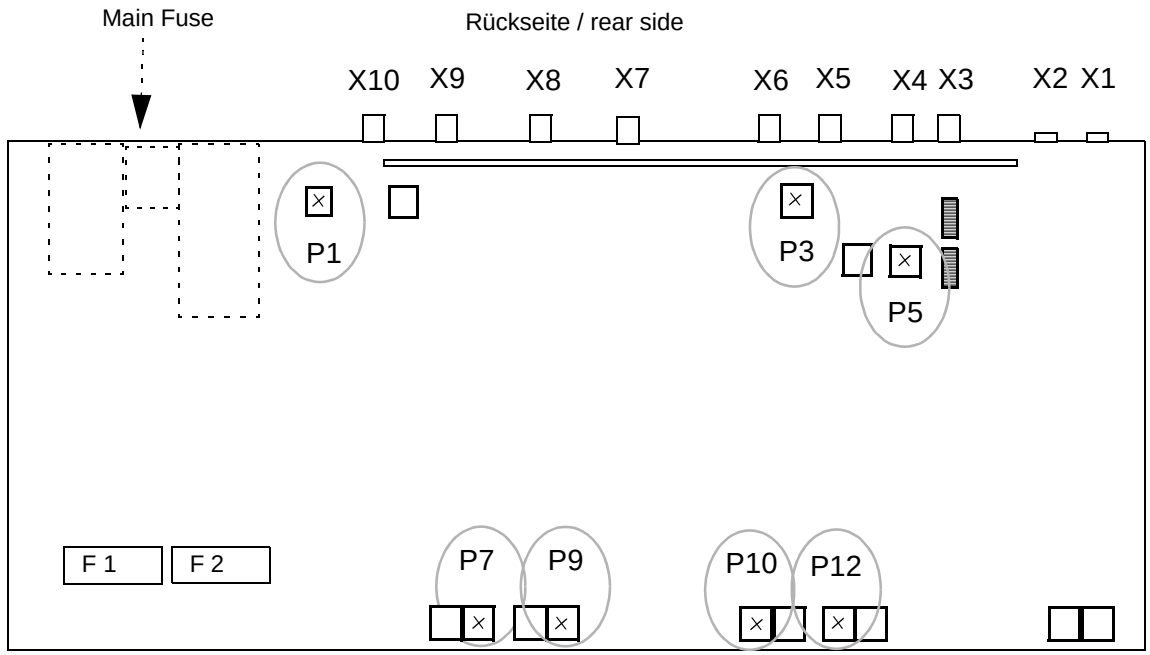


With HICOR: Adjusting the Amplitudes and Size/Position Parameters for VCR Playback (Upscan, H Norm).

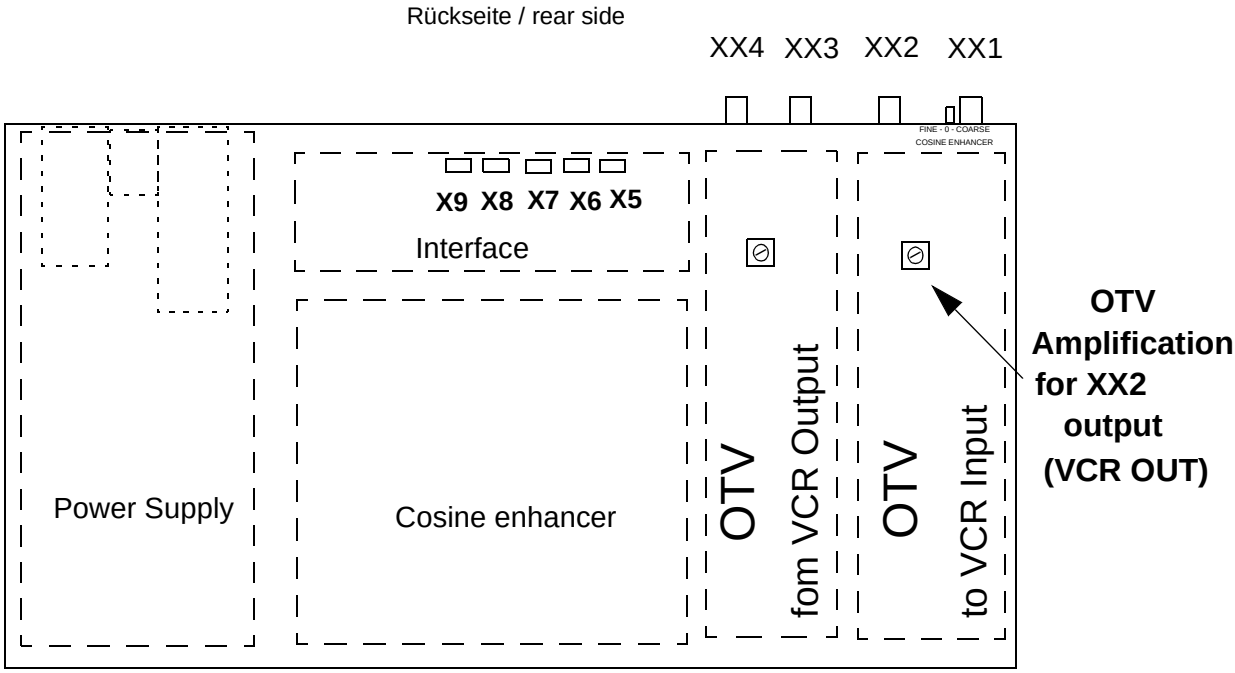
- If a cosine enhancer is configured (see Chapter Replacement), it must be switched off during the adjustment (in the 0 position).
- Make a dynamics test recording with the HICOR.
  - Use the Mavo monitor to measure the brightness in Fields 2L and 5R (monitor) and make a note of the results.
- Switch off the HICOR (backup mode) use the Service PC to adjust the ssame brightness on the monitor as with the HICOR (foreground - 2L field/background - 5R field, see Simomed H Adjustment Instructions).
- With the HICOR switched on, make a VCR recording.
- Play back the recording (Pause - Freeze).
  - Adjusting the OTV amplification (VCR output):
    Connect the oscilloscope Channel 1 to output XX2 (VCR Interface, from VCR output), set 200 mV, 5 ms, Trigger int. Channel 1
    Use potentiometer R251 in the OTV (for XX2 output, see illustration) to adjust the BAS amplitudes to 1V BAS, +/-30 mV.
  - Adjusting the upscan amplitudes:
    Connect the oscilloscope Channel 1 to output X6 (output to control room monitor) of the VSC 36 SHC (parallel to the monitor), set 200 mV, 5 ms, Trigger int. Channel 1. Use P1to adjust the S portion to 0.3 V, +/-30 mV.
    Mavo monitor:
    Use P3 in field 5R and use P5 in field 2L to adjust the same brightness as was measured with the dynamics test recording. Alternately repeat the adjustment.
- Adjust the upscan size/position parameters:
  IMPORTANT: This adjustment requires that the monitor be correctly adjusted (each Norm must be adjusted separately!). If necessary, monitor adjustment can be carried out as follows:
  With the Videomed S, select the grid (see Videomed S Service Instructions) set the HICOR to bypass mode, (i.e., 50 or 60Hz Norm is set), carry out a size/ position adjustment for the monitor.
  With the Videomed C, feed in the grid pattern generator; use the same procedure.
  Or if using the Monitor Multinorm Testbox, select the grid and Videomed S (50 Hz/ 1249 lines or 60Hz/1023 lines).
  - Make a VCR recording using a somewhat smaller collimation (for H and V determination).
  - Playback image must be horizontally centered on the monitor and H:V must be correct (with the circle - round, with the collimator - square).
    If vertical size / position are not adjustable (monitor adjustment may be required).
    Use P7 to adjust the horizontal position, centered to the monitor.
    Use P9 to adjust the horizontal size (with the circle, must be round).
    Alternately readjust the position / size.
    IMPORTANT: no synchronization problems may occur, e.g. position/size disturbing the synchronization range! If this is the case, use P10 for size and P12 for position and adjust the input parameters (memory) (P7 / 9 = used to adjust the memory output parameters).

- If a cosine enhancer is configured, it must be switched back on.

VSC 36 Scan Converter

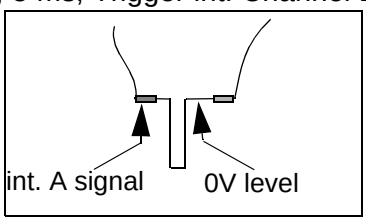


SSI22 VCR Interface



With Multistar T.O.P: Adjusting the Amplitudes and Size/ Position Parameters for VCR Playback (Upscan, H Norm).

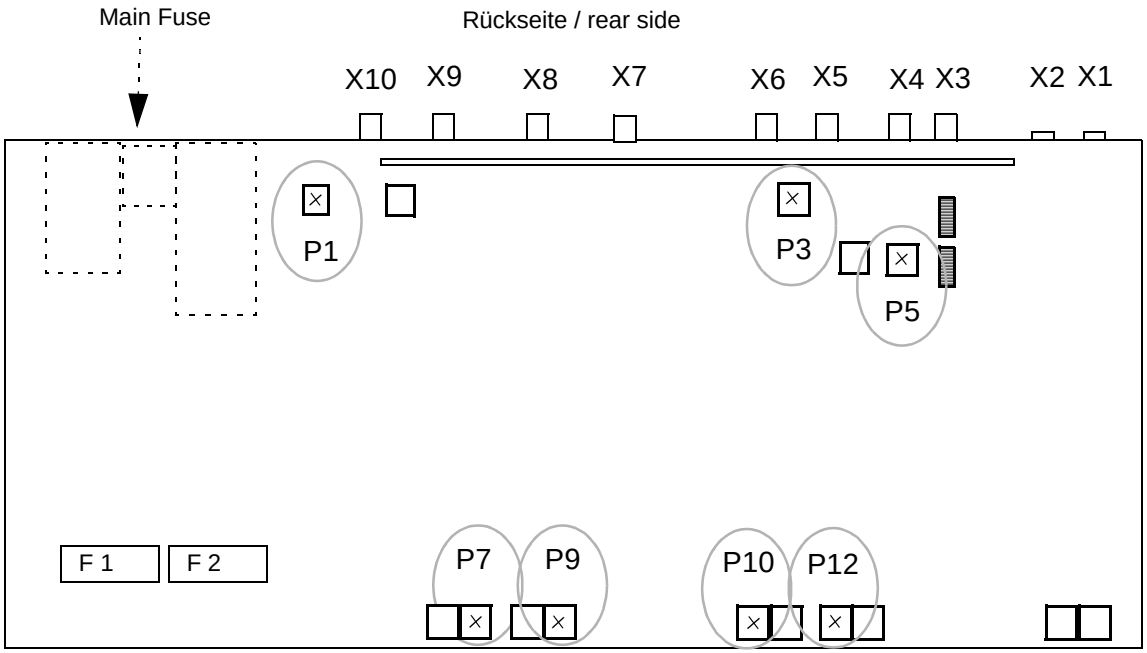
- If a cosine enhancer is configured (see Chapter Replacement), it must be switched off during the adjustment (in the 0 position).
- Make a dynamics test recording with the Polytron T.O.P.
  - Use the Mavo monitor to measure the brightness on the monitor in fields 2L and 5R and make a note of the results.
  - Make a VCR recording using the dynamics test.
- Play back the recording (Pause - Freeze).
  - Connect the oscilloscope Channel 1 to output XX2 (VCR Interface, from VCR output); set 200 mV, 5 ms, Trigger int. Channel 1.
  - Adjusting the OTV amplification (VCR output):
    Use the potentiomerter in the OTV (for XX2 output, see illustration) to adjust the BAS amplitudes to 1V BAS, +/-30 mV.
  - Adjusting the upscan amplitudes:
    Connect oscilloscope Channel 1 to output X6 (output to the control room monitor) of the VSC 36 SHC (parallel to monitor); set 200 mV, 5 ms, Trigger int. Channel 1
    Use P1 to adjust the S portion to 0.3 V, +/-30 mV.
    Use P3 to adjust the A portion of the int. DA converter to 0V, +5 mV.
    Use P5 to adjust theBA portion to 0.7V, +/-30 mV.

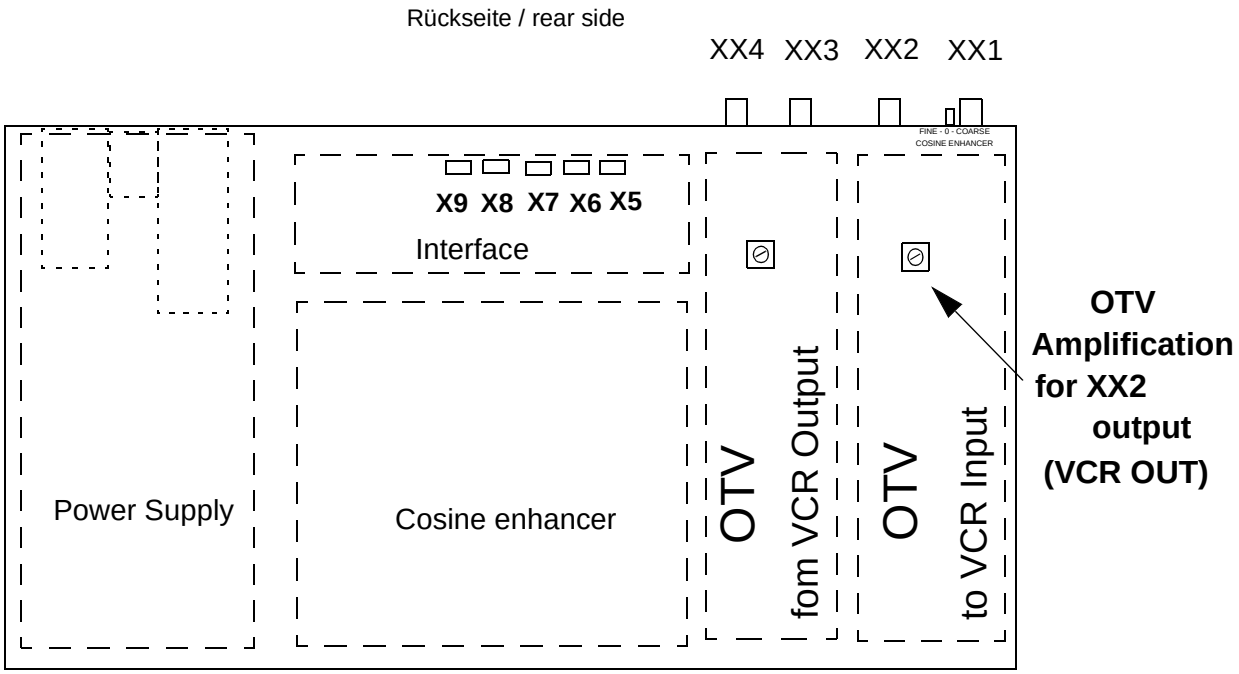
  - Adjusting monitor contrast using the VCR:
    Using the Service PC, set the same brightness on the monitor (foreground - 2L field /background - 5R field, see Simomed H Adjustment Instructions) as was measured for the dynamics test recording. Alternately repeat the adjustment.
- Adjusting the upscan size / position paramerters:
  IMPORTANT: This adjustment requires that the monitor be correctly adjusted (each Norm must be adjusted separately!). If needed, the monitor adjustment can be carried out as follows:
  If using the Monitor Multinorm Testbox, select grid and Videomed S (50 Hz/ 1249 lines or 60Hz/1023 lines).
  - Make a VCR recording using a somewhat closed collimator (for H and V determination).
  - Playback must be horizontally centered on the monitor and H:V must be correct (with the circle - round, with the collimator, square).
    If vertical size / position are not adjustable (monitor adjustment may be required).
    Use P7 to adjust the horizontal position, centered to the monitor.
    Use P9 to adjust the horizontal size (with circle, it must be round).
    Alternately repeat the adjustment of position / size.
    IMPORTANT: No synchronization problems may occur, e.g. position / size disturbing the synchronization range! If this is the case, use P10 for size and P12 for position to adjust the input parameters (memory) (P7 / 9 = adjustment of the output parameters of the memory).

- If a cosine enhancer is configured, it must be switched back on.

VSC 36 Scan Converter



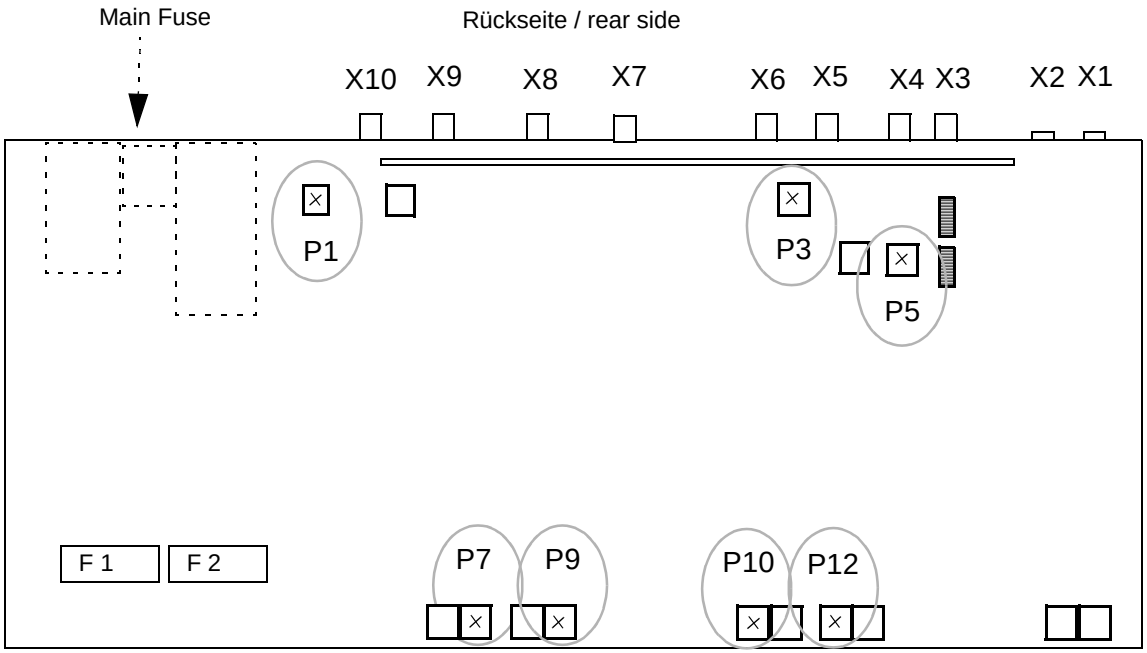
SSI22 VCR Interface



With Polytron / Digicor: Adjusting the Amplitudes and Size / Position Parameters for VCR Playback (Upscan, H Norm).

- If a cosine enhancer is configured (see Chapter Replacement), it must be switched off during the adjustment (in the 0 position).
- Make a dynamics test recording with the Polytron / Digicor.
  - Use the Mavo monitor to measure brightness in the 2L and 5R fields (monitor) and make a note of the results.
- Switch off the Polytron / Digicor (Emergency - Bypass mode). Use the Service PC to adjust the same brightness on the monitor (foreground - 2L field/ background - 5R field, see Simomed H Adjustment Instructions) as measured with Polytron / Digicor.
- Switch the Polytron / Digicor on, make a VCR recording.
- Play back the recording (Pause - Freeze).
  - Adjusting the OTV amplification (VCR output):
    Connect the oscilloscipe Channel 1 to output XX2 (VCR Interface, from VCR output); set 200 mV, 5 ms, Trigger int. Channel 1.
    Use potentiometer R251 in the OTV (for XX2 output, see illustration) to set the BAS amplitudes to 1V BAS, +/-30 mV.
  - Adjusting the upscan amplitudes:
    Connect the oscilloscope Channel 1to output X6 (output to control room monitor) of the VSC 36 SHC (parallel to monitor); set 200 mV, 5 ms, Trigger int. Channel 1.
    Use P1 to adjust the S portion to 0.3 V, +/-30 mV.
    Mavo monitor:
    Use P3 in field 5R, use P5 in field 2L to set the same brightness as was measured with the dynamics test recording. Alternately repeat the adjustment.
- Adjusting the upscan size / position parameters:
  IMPORTANT: This adjustment requires that the monitor is correctly adjusted (each Norm must be adjusted separately!). If necessary, the monitor adjustment can be carried out as follows:
  With the Videomed S, select the grid (see Videomed S Service Instructions), switch the Polytron / Digicor to Bypass or off, carry out a size/position adjustment on the monitor.
  With the Videomed C, feed in the grid pattern generator, same procedure as above. Or with the Monitor Multinorm Testbox, select grid and Videomed S (50 Hz 1240 lines or 60Hz/1023 lines).
  - Make a VCR recording with a somewhat smaller collimation (for H and V determination).
  - PLayback must be horizontally centered on the monitor and H:V correct (with a circle - round, with the collimator, square).
    If the vertical size / position are not possible (monitor adjustment may be required).
    Use P7 to adjust horizontal position, centerd to the monitor.
    Use P9 to adjust horizontal size (with a circle, it must be round).
    Repeat the adjustment of position / size alternatingly.
    IMPORTANT: No synchronization problems may occur, e.g. position / size disturbing the synchronization range! If this is the case, use P10 for size and P12 for position to adjust the input parameters (memory) (P7 / 9 = adjustment of the output parameters of the memory).
- If a cosine enhancer is configured, it must be switched back on.

VSC 36 Scan Converter



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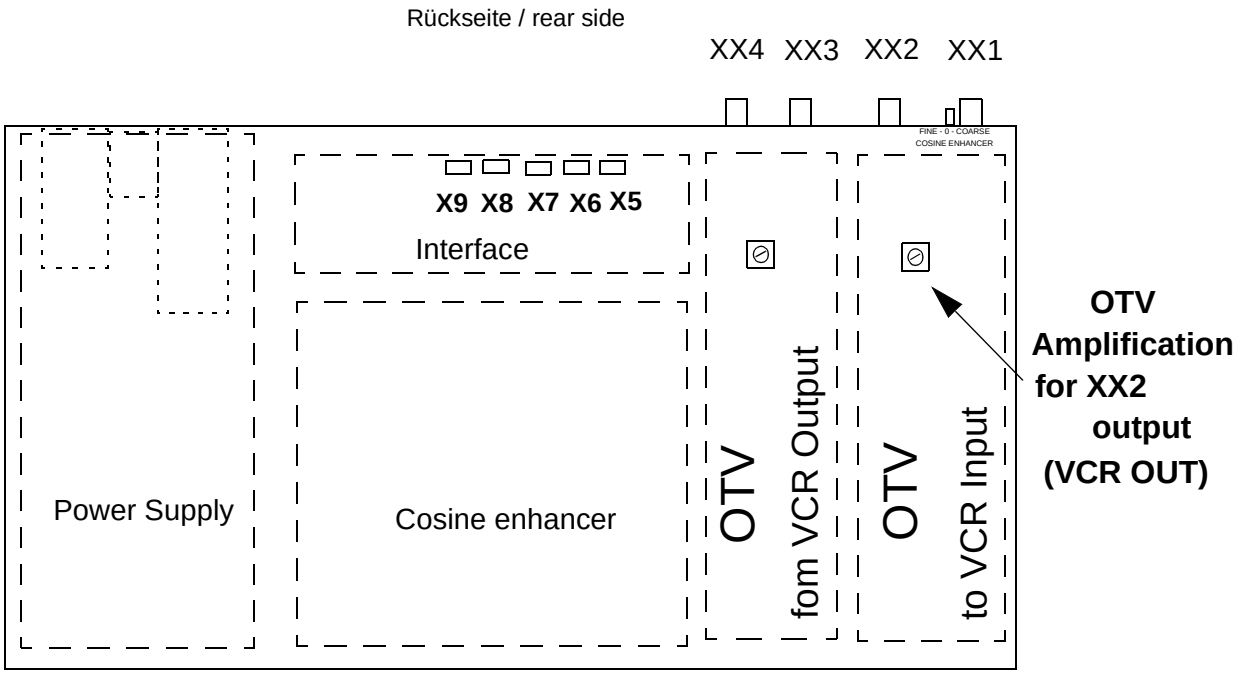
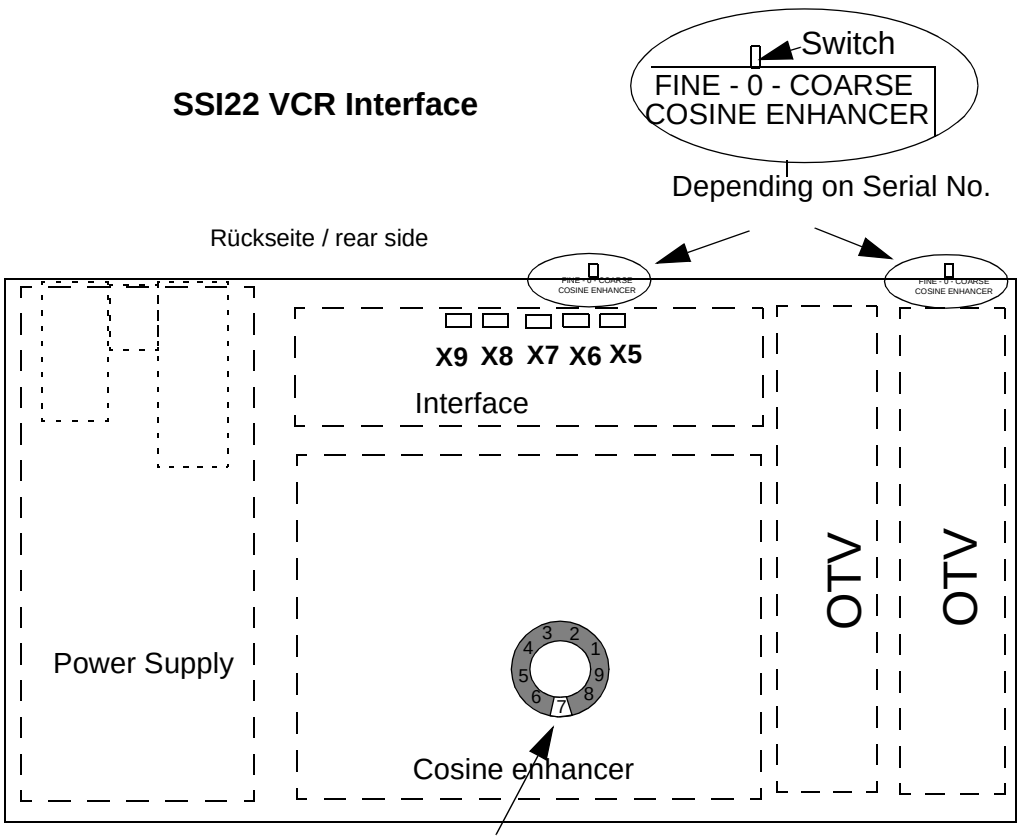


Adjusting the Cosine Enhancer

- In units with Serial Nos. up to 95 391 “some” enhancers were installed whose switch must be set to the “0 position“ (off).
  Starting with Serial No. 95 391, the cosine enhancer is fully functional.
- The cosine enhancer is switched on by means of the switch on the rear of the interface, or the “type“ of enhancement can be selected.
- The default values for the adjustment are:
  Set the switch to FINE
  Set adjustment element to Position 7
- Depending on the customer‘s request or requirement, varations from this adjustment can be made:
  The degree of enhancement can be set using the adjustment element (higher number corresponds to greater enhancement).
  Calculation of the enhancement can be changed by means of the switch (COARSE corresponds to coarse).
  Recommendation: Always set the switch to “Fine“ (low noise).
  Set enhancement (adjustment element) max. so far that a white border around the edges can no longer be seen.



- Chap. 1 - 1
  Expansion of the general remarks.
- Chap. 1 - 2
  Expansion of required aids.
- Chap. 2 - 1
  New illustration.
- Chap. 2 - 2
  Expansion of the description, new illustration.
- Chap. 2 - 3
  New illustration.
- Chap. 2 - 5
  Expansion of cabling.
- Chap. 4 - 1
  Expansion of the configuration when the VCR is replaced.
- Chap. 4 - 2/3
  Expansion to include the cosine enhancer, as well as the warning signal.
- Chap. 4 - 4
  Expansion to include use of the Digicor without a control room monitor.
- Chap. 5
  New.
  Expansion of the adjustment to include image alignment adjustment and cosine enhancer.

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